

WHAT WE CLAIM IS:

- 5 1. A line unit, connected to at least a first optical fiber and a second optical fiber, said line unit comprising:
- a first line assembly including:
- a first monitoring receiver, coupled to said first optical fiber, for receiving first control information associated with a first optical signal transmitted over said first optical fiber; and
- 10 at least one first pump laser, coupled to said first optical fiber;
- a second line assembly including:
- a second monitoring receiver coupled to said second optical fiber;
- and
- at least one second pump laser, coupled to second optical fiber; and
- 15 wherein said first and second monitoring receivers are connected such that said first control information is sent from said first monitoring receiver to said second monitoring receiver.
- 20 2. The line unit of claim 1, wherein said control information is modulated onto an envelope of said optical signal.
3. The line unit of claim 1, wherein said control information is a command to adjust a bias current of one of said at least one first and said at least one second pump lasers.
- 25 4. The line unit of claim 1, wherein said control information is a command to measure a power of one of said at least one first and said at least one second pump lasers.
- 30 5. The line unit of claim 1, wherein said control information is a command to measure a power of an optical signal transmitted over one of said first and second optical fibers.

6. The line unit of claim 1, wherein said first monitoring receiver further comprises:

5 a first demodulating unit for receiving said first optical signal and demodulating said first control information associated therewith; and

a first control unit for operating on said demodulated first control information.

10 7. The line unit of claim 6, wherein said first control unit is connected to said at least one first pump laser and wherein said first control unit adjusts a bias current associated with one of said at least one first pump lasers based on said demodulated first control information.

15 8. The line unit of claim 6, wherein said first control unit is connected to said at least one first pump laser and wherein said first control unit monitors a power associated with one of said at least one first pump lasers based on said demodulated first control information

20 9. The line unit of claim 6, wherein said second monitoring receiver further comprises:

a second control unit for operating on said demodulated first control information.

25 10. The line unit of claim 9, wherein said second control unit is connected to said at least one second pump laser and wherein said second control unit adjusts a bias current associated with one of said at least one second pump lasers based on said demodulated first control information.

30 11. The line unit of claim 9, wherein said second control unit is connected to said at least one second pump laser and wherein said second control unit monitors a power associated with one of said at least one second pump lasers based on said demodulated first control information.

12. The line unit of claim 1, wherein said second monitoring receiver further comprises:

5 a second demodulating unit for receiving a second optical signal on said second optical fiber and demodulating second control information associated therewith; and

a second control unit for operating on said demodulated second control information.

10 13. The line unit of claim 12, wherein said second control unit sends said second control information to said first control unit.

14. The line unit of claim 12, further comprising:

15 a first secondary control unit, connected to said first control unit, said second control unit, and said at least one first pump laser, for controlling said at least one first pump laser in accordance with said demodulated second control information when said first control unit is malfunctioning.

15. The line unit of claim 9, further comprising:

20 a second secondary control unit, connected to said first control unit, said second control unit, and said at least one second pump laser, for controlling said at least one first pump laser in accordance with said demodulated first control information when said first control unit is malfunctioning.

25 16. The line unit of claim 1, wherein said control information further comprises:

an address associated with said line unit, an operation code associated with an operation to be performed.

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17. An optical communication system comprising:

a plurality of line units, each connected to a first optical fiber and a second optical fiber which carry first and second optical signals, respectively, each said line unit including:

5 a first monitoring receiver, coupled to said first optical fiber, for receiving first control information associated with said first optical signal;

a second monitoring receiver, coupled to said second optical fiber, for receiving second control information associated with said second optical signal, and

10 an interconnect for passing said first control information from said first monitoring receiver to said second monitoring receiver and said second control information from said second monitoring receiver to said first monitoring receiver; and

15 two terminals, one at either end of said first and second optical fibers, at least one of which transmits said first and second control information.

18. The optical communication system of claim 17, wherein said line unit includes at least two sets of pump lasers, one each associated with said first and second monitoring receivers.

19. The optical communication system of claim 17, wherein said first and second control information is modulated onto an envelope of said first and second optical signals, respectively.

20. The optical communication system of claim 1, wherein said control information is a command to adjust a bias current of one of said at least one first and said at least one second pump lasers.

21. The optical communication system of claim 1, wherein said control information is a command to measure a power of one of said at least one first and said at least one second pump lasers.

22. The optical communication system of claim 1, wherein said control information is a command to measure a power of an optical signal transmitted over one of said first and second optical fibers.

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23. The optical communication system of claim 1, wherein said first monitoring receiver further comprises:

a first demodulating unit for receiving said first optical signal and demodulating said first control information associated therewith; and

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a first control unit for operating on said demodulated first control information.

24. The optical communication system of claim 6, wherein said first control unit is connected to said at least one first pump laser and wherein said first control unit adjusts a bias current associated with one of said at least one first pump lasers based on said demodulated first control information.

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25. The optical communication system of claim 6, wherein said first control unit is connected to said at least one first pump laser and wherein said first control unit monitors a power associated with one of said at least one first pump lasers based on said demodulated first control information

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26. The optical communication system of claim 6, wherein said second monitoring receiver further comprises:

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a second control unit for operating on said demodulated first control information.

27. The optical communication system of claim 9, wherein said second control unit is connected to said at least one second pump laser and wherein said second control unit adjusts a bias current associated with one of said at least one second pump lasers based on said demodulated first control information.

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28. The optical communication system of claim 9, wherein said second control unit is connected to said at least one second pump laser and wherein said second control unit monitors a power associated with one of said at least one second pump lasers based on said demodulated first control information.

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29. The optical communication system of claim 1, wherein said second monitoring receiver further comprises:

a second demodulating unit for receiving a second optical signal on said second optical fiber and demodulating second control information associated therewith; and

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a second control unit for operating on said demodulated second control information.

30. The optical communication system of claim 12, wherein said second control unit sends said second control information to said first control unit.

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31. The optical communication system of claim 12, further comprising:

a first secondary control unit, connected to said first control unit, said second control unit, and said at least one first pump laser, for controlling said at least one first pump laser in accordance with said demodulated second control information when said first control unit is malfunctioning.

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32. The optical communication system of claim 9, further comprising:

a second secondary control unit, connected to said first control unit, said second control unit, and said at least one second pump laser, for controlling said at least one first pump laser in accordance with said demodulated first control information when said first control unit is malfunctioning.

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33. The optical communication system of claim 1, wherein said control information further comprises:

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an address associated with said line unit, an operation code associated with an operation to be performed.